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China's Energy Transition Brief: How Power Market Reforms are Meeting Climate Goals

Summary

China's power market reforms offer an opportunity to advance the nation's ambitious climate goals. Guided by national power reform initiatives, provinces are piloting programs to incentivize green power trading, granting grid access to low-carbon resources, and promoting efficient energy usage. In the power generation sector, provinces are experimenting with new business models, low-carbon resources, and regional collaboration in wholesale market operations while also developing green power offerings for retail customers. Recognizing the importance of ancillary services and capacity markets in addressing renewable energy intermittency, provinces are increasingly incorporating energy storage in policy designs. Transmission reforms are making progress in facilitating renewable energy management beyond provincial boundaries, while distribution grid expansion to accommodate distributed resources has been slower than expected. On the demand side, time-of-use policies have been widely adopted across provinces, although they remain administratively controlled. Other demand response measures, such as virtual power plants, are gaining traction, with cities taking the lead on experimentation.

Moving forward, policy makers should focus on promoting cross-provincial green power exchange, integrating green power options into retail packages, mobilizing non-state investments, and further deregulating end-user electricity. More importantly, ongoing subnational experimentation amid supportive national policies is essential to leverage and scale emerging decarbonization technologies.

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1. Power sector reform and relationship to climate goals

Over the past two decades, China has made breakthroughs in reforming its power sector to improve efficiency and introduce competition. Previously, the electric power system was predominantly owned and operated by the State Power Corporation of China (SPCC),[1] a vertically integrated monopoly that controlled over half of the country's generation capacity, nearly all transmission and distribution (T&D) assets, and the day-to-day operations of the grid network.[2] Because this vertically integrated structure led to frequent power outages and operational inefficiency, the State Council released the *Reform Plan of the Power System* (Document No. 5) in 2002.[3] Document No. 5 separated power generation from grid operations and dismantled the SPCC into five major generation companies and two grid companies.[4] A further push for competition came with *Opinions on Deepening Reform of the Power System* (Document No. 9), released in 2015 by the Central Committee of the Communist Party of China and the State Council.[5] Document No. 9, along with implementation plans from the National Development and Reform Commission (NDRC) and National Energy Administration (NEA),[6] laid the groundwork for comprehensive power market reforms. In 2022, NDRC and NEA took another step toward reform by prioritizing the creation of a united national power market system.[7] These agencies then released a roadmap and protocol for integrating a multi-tiered framework to operate under consistent market rules by 2030, along with supervision methods and implementation measures for power transactions both within and across provincial boundaries.[8]

With China's pledge, in 2020, to achieve carbon peaking by 2030 and carbon neutrality by 2060,[9] decarbonization has increasingly become a focus of power market reforms. These reforms intersect with climate goals in two main ways. First, the power sector is critical to the Chinese government's ability to attain climate goals, as it accounted for roughly 45% of the country's carbon emissions in 2024.[10] Recognizing this, the national *14th Five-Year Plan for a Modern Energy System* highlights power market reform as an essential component of building a modern energy system compatible with climate goals.[11] Second, power market reform can promote decarbonization across China's electricity system;

[1] Edward A. Cunningham, 2015.
[2] Yi-chong Xu, 2002.
[3] State Council, 2002
[4] State Council, 2002.
[5] State Council, 2015.
[6] NDRC & NEA, 2015.
[7] NDRC & NEA, 2022a.
[8] NEA, 2024a; NDRC, 2024.
[9] Mohong & Yuyang, 2021
[10] European Commission. Joint Research Centre. & IEA., 2024.
[11] NDRC and NEA, 2024.

reform can facilitate green power trading, grant grid access to low-carbon resources, and promote climate-friendly energy usage, as illustrated in Table 1. These reform efforts collectively enhance the flexibility of the power system to better integrate renewable energy, improve energy efficiency, and ultimately align the power sector with China's broader climate goals.

Table 1. Power market reforms and linkages to climate goals

Sector	Reform	Linkage to climate goals	Approach
Overarching market design	Incentivizing green power certificate trading	Promoting renewable energy generation in the post-subsidy era	Funding renewable energy generation with revenues collected from green power certificate trading
Generation	Building wholesale market	Advancing green power trading	Incentivizing mid- to long-term agreements for increased trading volume of green power
			Building spot market to integrate low marginal cost resources
	Introducing competition into the retail market	Indirectly supporting renewable energy	Incorporating green power trading options into retail power packages
	Developing ancillary market	Addressing the fluctuation of power output by renewables	Introducing energy storage to participate in ancillary services
	Developing capacity market	Supporting spot market and power adequacy	Promoting energy storage as a future participant in capacity market development
Transmission and Distribution	Transforming grid assets into the "common carrier"	Granting grid access to low-carbon resources	Establishing new revenue models for transmission tariffs to support large-scale renewable energy utilization
			Introducing non-state investment for distribution grid expansion to integrate distributed resources
Demand	Deregulating end-user electricity prices	Incentivizing efficient energy usage by varying electricity prices	Adopting time-of-use pricing to reflect power value at different demand periods

	Incentivizing demand response	Lowering energy usage during peak demand periods	Introducing capacity payment programs and emphasizing virtual power plants

2. Deregulating power generation and advancing green power trading

Document No. 9 emphasizes building a robust wholesale market and introducing retail market competition. Guided by national policies, provinces are running pilot programs to explore practical approaches to achieve reform objectives. This strategy builds on the long-standing role of provincial power grids as the basic unit for power system balancing in China, making them key drivers of power market reforms. Moreover, provinces serve as testing grounds for innovative policies, often taking the lead in policy experiments and technology trials that ultimately feed into national policy making.

Provincial pilot programs have shown substantial progress. In 2023, market-oriented transactions of renewable electricity reached 684 TWh, accounting for 47.3% of all renewable energy generated in China.[12] In the wholesale market, spot markets are being developed to better incentivize green power trading, and mid- and long-term power purchase agreements are becoming more flexible to prioritize renewables. Although the retail market has not explicitly supported decarbonization, provinces are developing protocols for designing retail power packages that integrate green power trading. While ancillary and capacity markets are still nascent and remain dominated by coal-fired power, several provinces are incorporating energy storage into their market designs. Further, provincial pilots are increasingly emphasizing renewable energy, energy storage, and emerging decarbonization technologies, and benefiting from associated technological advancements and cost decreases. Provinces are also pioneering new business models and fostering regional collaboration to support reform objectives across all aspects of the generation sector.

2.1. The wholesale market: Directly supporting green power trading

Wholesale market development efforts pursue two major transaction types to support green power trading: spot market transactions and mid- to long-term power purchase agreements. The spot market[13] is a cornerstone for integrating large amounts of renewables into electricity grids, as it favors power plants with lower marginal costs, such

[12] NEA, 2024a.

[13] "Spot market" refers to electricity trading between generators and consumers on the day-ahead and intra-day scales, usually settled on a 15-minute basis. This market is the basis for discovering the real-time value of electricity and provides a reference for mid- to long-term transaction prices. See Zihao Chen et al., n.d.

as wind and solar power (which have zero fuel costs). Meanwhile, mid- to long-term power purchase agreements[14] enable direct exchange of green power between power generators and large industrial consumers. Notably, the NDRC and NEA have established inter-provincial power trading hubs in Beijing and Guangdong, each of which has released specific protocols for green power exchange.[15] Analysis by the International Energy Agency indicates that, under various scenarios, spot market development and mid- to long-term contracts, along with market-based electricity dispatch, will lead to reductions in China's carbon emissions by at least 28% by 2035.[16]

Provincial spot market pilots have advanced significantly, backed by strong central government support. These pilots have progressed from provincial trials to regional collaboration.[17] Major progress includes:

(a) Initial pilots: The NDRC and NEA allowed eight provinces to launch pilots in August 2017, followed by a second batch of six additional provinces in 2021.[18]
(b) Enhanced pilots: The NDRC directed provinces to extend pricing settlement periods and adapt market models to their specific energy profiles. For instance, Sichuan tailored its model to accommodate its hydropower-dominated system and adapt to seasonal variations therein. Meanwhile, provinces such as Liaoning, Jiangsu, Anhui, Henan, Hubei, Jiangxi, and Shaanxi implemented longer settlement periods to improve market efficiency, as did the Hebei Southern Grid.[19]
(c) Regional collaboration: Since 2023, spot market pilots have expanded to support cross-provincial power trading in South China, the Yangtze River Delta, and the Jing-Jin-Ji region.[20]

Provincial pilots of mid- and long-term power purchase agreements are proceeding apace, leveraging new business models, diversifying low-carbon resources, and enhancing regional collaboration to advance green power trading. Key developments include:

[14] Mid- to long-term power purchase indicates the electricity transactions with a multi-day to multi-year timeframe, which are made between power generators and consumers through bilateral negotiations or centralized bidding. See Zihao Chen et al., n.d.
[15] NDRC & NEA, 2016; Beijing Power Trading Center, 2023.
[16] IEA, 2023.
[17] NDRC and NEA, 2023.
[18] The first batch of provinces include South China, West Inner Mongolia, Zhejiang, Shanxi, Shandong, Fujian, Sichuan and Gansu. The second batch includes Shanghai, Jiangsu, Anhui, Liaoning, Henan and Hubei. NDRC & NEA, 2017a; NDRC, 2021a.
[19] NDRC & NEA, 2023.
[20] NDRC & NEA, 2023.

(a) Aggregating distributed resources: Zhejiang, Hebei South Grid, and Fujian now enable the aggregation of distributed solar to participate in power purchase agreements,[21] following the NYISO's DER & Aggregation participation model.[22]
(b) Including clean energy and energy storage: Various provinces are exploring ways to include clean energy and storage technologies. For instance, Guizhou introduced measures to support renewable energy,[23] Guangdong encourages pumped storage hydropower,[24] and Hebei South Grid, Shaanxi, Anhui, and Gansu all incorporate energy storage into direct power purchases.[25]
(c) Regional pilots: China's northwestern provinces, including Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang, are experimenting with regional mid- to long-term power purchases to serve the northwest regional grid.[26]

2.2. The retail market: Indirectly supporting green power trading

Unlike the above-mentioned wholesale market reforms, which directly advance green power trading, retail market reforms focus on creating competition and providing diverse options for consumers.[27] Since 2016, 13 provinces have opened their retail markets to private businesses to bolster competition.[28] Although these reforms do not explicitly target decarbonization, they can contribute to climate goals by introducing retail power packages[29] that include green power options. Sichuan, Zhejiang, and Guangdong have developed their own protocols for these offerings.[30] Notably, Sichuan has introduced a specialized package for green power that indicates prices should be set at a rate that reflects its environmental value.[31]

[21] Xinhua News, 2024; BJX News, 2024a.
[22] This DER & Aggregation model allows distributed energy resources (DERs) to participate in markets administered by the New York Independent System Operator (NYISO) in the United States. DERs that are dispatchable in real-time may elect to provide power, ancillary services, and capacity through aggregations. See DER & Aggregation Participation Model, n.d.
[23] Guizhou Energy Bureau, 2023a.
[24] Guangdong Energy Bureau, 2024a.
[25] Shaanxi Development and Reform Commission, 2024; BJX News, 2024b; Anhui Energy Bureau, 2024; Gansu Department of Industry and Information Technology, 2024.
[26] Northwest Supervision Bureau of the National Energy Administration, 2024.
[27] NDRC, 2015.
[28] The first batch includes Yunnan, Guizhou, Chongqing and Guangdong and the second batch extends to Beijing, Hainan, Gansu, Heilongjiang, Zhejiang, Jilin, Fujian, Jiangsu and Jiangxi. See BJX News, 2016.
[29] The retail power package refers to a plan offered by an electricity retailer where customers can choose a specific price per kWh based on their usage patterns. See Sun et al. 2021.
[30] Sichuan Power Trading Center, 2024; Zhejiang Development and Reform Commission et al., 2023; Guangdong Energy Bureau, 2023.
[31] Sichuan Power Trading Center, 2024.

2.3. Ancillary services and capacity markets: Promoting energy storage

Both the ancillary services market[32] and the capacity market[33]—critical components for supporting spot markets and addressing renewable energy intermittency—remain underdeveloped and still depend heavily on coal-fired power.[34] However, energy storage is emerging as a valuable resource in both markets.[35] Provinces are working to diversify resources to support ancillary services, with energy storage increasingly being recognized as a key solution. Guizhou and Henan have prioritized energy storage for peak shaving services in their pilot policies.[36] While current capacity markets primarily focus on coal-fired power whose prices are set administratively,[37] energy storage is nonetheless gaining traction. Policy drafts in Guangdong, Xinjiang, Inner Mongolia, Shandong, and Hebei highlight energy storage as a future participant in capacity market development.[38]

3. Reforming transmission and distribution: Granting grid access to low-carbon resources

In the transmission sector, a new revenue model is evolving to support provincial- and cross-provincial power exchange and enable the large-scale utilization of renewable energy. This model aims to open grid access to diverse low-carbon resources, intending to break the monopoly of grid companies and transform grid assets into "common carriers."[39] More specifically, it calls for a shift from fixed rates to tariffs based on a "permitted cost plus reasonable profits" model, which are differentiated by voltage levels and reassessed every three years. Provincial pilots began testing this approach in 2014, with the first pilots being launched in the Shenzhen and West Inner Mongolia grids, followed by 17 more provinces in 2015 and 2016.[40] After three years of pilots, the NDRC introduced

[32] The ancillary market is a system that includes functions to help maintain grid frequency and provide short-term backup power if a generating unit stops. See NEA, 2017.
[33] The capacity market is a system that requires utilities to support enough generating capacity to meet forecasted load plus a reserve margin to maintain grid reliability. See US Electricity Markets 101, n.d.
[34] David Sandalow et al., n.d.
[35] NEA, 2021.
[36] Peak shaving service is the process of reducing electrical power consumption during periods of high demand. Utilities may adapt the peak loads on the generation (e.g. dispatchable power plants), on the demand side with the end-user's participation, and by grid upgrade measures. A promising approach is to deploy energy storage, by installing storage units at strategic points, such as power plants or by incentivizing the end-customers to install and control storage units within the grid. See China Energy News, 2023; Henan Energy Regulatory Office, 2023; Efkarpidis et al., 2023.
[37] NDRC, 2023.
[38] Guangdong Development and Reform Commission, 2024; Xinjiang Development and Reform Commission, 2023; Inner Mongolia Energy Bureau et al., 2023; Shandong Development and Reform Commission & Shandong Energy Bureau, 2023; Hebei Development and Reform Commission, 2024.
[39] Benchimol, 2024.
[40] The first batch includes Hubei, Ningxia, Anhui, Yunnan, and Guizhou, and the second batch includes North China regional grid and Beijing, Tianjin, Southern Hebei, Northern Hebei, Shanxi, Shaanxi, Jiangxi, Hunan, Sichuan, Chongqing, Guangdong, and Guangxi grids. See NDRC, 2017.

standardized methods for determining tariffs for provincial, regional, and cross-regional transmission.[41] These reforms have led to nationwide reductions in provincial grid tariffs.[42]

On the distribution grid, reforms may catalyze distributed wind and solar development by encouraging non-state investments.[43] From 2016 to 2020, five batches of distribution grid expansion pilots, totaling 459 projects, were rolled out nationwide.[44] However, progress has been slower than expected due to various challenges including load management, alignment with local grid planning, and implementation delays.[45] These issues resulted in the cancellation of 24 pilot programs in 2019.[46]

4. Climate-friendly demand-side measures

Demand-side management has become a focal point in China's national and provincial energy policies, supported by technological advancement, decarbonization goals, and enhanced grid flexibility enabled by supply-side reforms. Current demand-side measures aim to deregulate end-user electricity rates and enhance demand response programs through advanced technologies, such as virtual power plants (VPPs).[47]

To incentivize the most efficient use of the power system with varying electricity prices, the NDRC enhanced efforts to promote time-of-use pricing in 2021 and introduced peak, off-peak, and seasonal rates, along with implementation guidelines.[48] Since then, time-of-use pricing has been widely adopted across all provinces except Tibet and East Inner Mongolia. These pricing plans vary significantly and fall into three main categories: (a) end-user variations, where Jiangsu, Zhejiang, Shaanxi, Qinghai, and Shanghai specify different requirements for industrial and commercial consumers;[49] (b) seasonal rate

[41] NDRC, 2018.
[42] Zihao Chen et al., n.d.
[43] NDRC, 2018.
[44] NDRC & NEA, 2018; NDRC & NEA, 2017b; NDRC & NEA, 2019a.
[45] NDRC & NEA, 2019b.
[46] NDRC & NEA, 2019b.
[47] A virtual power plant is a collection of small-scale energy resources that, aggregated together and coordinated with grid operations, can provide the same kind of reliability and economic value to the grid as traditional power plants. See Mills, 2023.
[48] Time-of-use is a rate plan in which rates vary according to the time of day, season, and day type (weekday or weekend/holiday). Higher rates are charged during the peak demand hours and lower rates during off-peak demand hours. This rate structure provides price signals to energy users to shift energy use from peak hours to off-peak hours. See NDRC, 2021b; California Public Utilities Commission, n.d.
[49] BJX News, 2024c; Heilongjiang Development and Reform Commission, 2022; Gansu Development and Reform Commission, 2021; Jilin Development and Reform Commission, 2021; Sichuan Development and Reform Commission, 2023a; Jiangsu Development and Reform Commission, 2023; Hubei Development and Reform Commission, 2024; Shandong Development and Reform Commission, 2022; China Energy News, 2024

variations, where all but four provinces (Guizhou, Guangxi, Ningxia, and Gansu) include seasonal differences in their time-of-use policies; and (c) peak and off-peak rate variations, where substantial differences exist between peak and off-peak rates, and gaps can be as high as 70% in Xinjiang and Shandong.[50] However, these time-of-use pricing policies remain administratively controlled and therefore do not accurately reflect real-time energy values.

Provinces are also exploring innovative demand-side management measures, with VPPs emerging as a prominent solution. Between 2021 and 2023, 17 provinces[51] introduced various measures to incentivize demand response, including diverse participant engagement, subsidy schemes, and capacity payment programs. In 2024, the NEA formally defined VPPs as a "new market participant" and recognized their importance in demand-side management.[52] This recognition has accelerated VPP adoption; so far, eight provinces have established protocols to guide VPP participation in demand management.[53] Further, pioneering city-level initiatives are exploring VPP applications. For instance, Shenzhen city (Guangdong province) and Jinhua city (Zhejiang province) rolled out subsidy programs to encourage VPP participation by end users.[54] Hefei city (Anhui province) prioritized electric vehicle chargers to participate in VPPs.[55] Chengdu city (Sichuan province) released a comprehensive 2023–2025 plan for VPP development, and put its own management platform into operation in June 2024.[56]

[50] BJX News, 2024c.
[51] They are Zhejiang, Hainan, Guangdong, Yunnan, Gansu, Sichuan, Hebe Sichuan, Guizhou, Jiangsu, Ningxia, Shandong, Shaanxi, Fujian, Chongqing, Anhui, Guangxi and Hubei. See Zhejiang Development and Reform Commission, 2024; Hainan Development and Reform Commission, 2023; Guangdong Power Trading Center, 2023; Yunnan Energy Bureau, 2023; Gansu Department of Industry and Information Technology, 2023; Sichuan Development and Reform Commission, 2023b; Hubei Energy Bureau, 2021; Guangxi Power Grid Company, 2022; Anhui Energy Bureau, 2022; State Grid Chongqing Electric Power Company, 2022; Fujian Development and Reform Commission, 2024; Shaanxi Development and Reform Commission, 2021; Shandong Development and Reform Commission & Shandong Energy Bureau, 2022; Ningxia Reform and Development Commission, 2023; Jiangsu Development and Reform Commission, 2022; Guizhou Energy Bureau, 2023b; Hebei Development and Reform Commission, 2023.
[52] NEA, 2024b.
[53] These provinces are Guangdong, Zhejiang, Shandong, Chongqing, Shanghai, Hubei, Hunan, and Liaoning. See Guangdong Energy Bureau, 2024b; NEA, 2024c; Chongqing Daily, 2024; Shanghai Development and Reform Commission, 2023; Hubei Power Trading Center, 2024; Hunan Power Trading Center, 2024; Liaoning Department of Industry and Information Technology & Liaoning Development and Reform Commission, 2024.
[54] Xinhua News Agency, 2023; The Paper, 2023.
[55] State Grid News, 2024.
[56] Chengdu Energy Leading Group Office, 2023.

5. Green power certificate trading: Supporting renewable energy generation

China's approach to supporting renewable energy generation has also shifted from a subsidy-based model to a market-oriented mechanism. In 2021, the NDRC announced the phase-out of subsidies for wind and solar power, marking a transition to a post-subsidy era. Renewable energy is now expected to receive support through revenues generated by trading green power certificates, similar to renewable energy credits (RECs).[57] In 2017, the NDRC and NEA introduced a voluntary green power certificate trading system.[58] But because green power purchases were not mandated, this system remained largely inactive. To address this, a quota-based system, akin to the U.S. renewable portfolio standard (RPS), was launched in 2019 and set annual targets for provinces to consume renewable energy.[59] Despite these efforts, green power certificates have struggled to fulfill RPS-like obligations and provide market-driven revenues for renewable energy generators.

6. Challenges and opportunities

China's power market reforms can meaningfully advance its ambitious climate goals. However, balancing energy affordability, reliability, and sustainability has become increasingly complex. Multi-front reforms that directly or indirectly support decarbonization may have overlapping goals and timelines, presenting a policy coordination challenge. For instance, the link between spot markets and long-term power purchase agreements remains unclear,[60] because this area involves multiple stakeholders (e.g., grid companies, dispatching organizations, generation companies, and end-users) whose conflicting interests complicate efforts to align reform objectives.

Furthermore, while published protocols and roadmaps have sought to better coordinate power market operations and create a unified national market, a more powerful legal framework is needed to align market participant interests and empower national institutions for greater accountability. While Article 42 of China's newly enacted Energy Law[61] reaffirmed the intention to build a national power market, challenges remain in

[57] China's green power certificate trading is similar to renewable energy credit (REC) trading under the renewable portfolio standard (RPS) in the U.S. The RPS is a mandate that requires electricity providers to generate a certain amount of their power from renewable sources, and each MWh of electricity generated from renewable energy can be verified as a REC. Then electricity providers can comply with RPS by purchasing REC rather than actually producing electricity from renewable energy. In this way, electricity providers can collect revenues by trading RECs rather than receiving subsidies. See NDRC & NEA, 2019c.
[58] NDRC, NEA, & Ministry of Finance, 2017
[59] NDRC, 2019
[60] China Energy News, 2020.
[61] NEA, 2024c.

enforcement, as energy sector laws primarily target industrial transformation but often lack binding regulations.

In the generation sector, while provincial pilot programs have significantly leveraged new technologies and business models to enhance wholesale market operations, the next step will require a stronger focus on cross-provincial green power exchange. It is thus expected that policy makers will break down provincial barriers. Although regional initiatives on spot markets and mid- and long-term power purchases are underway, broader regulatory reform is essential. Moreover, in the retail market, more provinces may develop protocols for retail power packages and incorporate green power options, as Sichuan has done. Additionally, the ancillary services and capacity markets require further development. The challenge lies not only in designing market-oriented mechanisms, but also in making these designs climate-friendly. Some provincial policy drafts are exploring energy storage technology, while experimentation with market-based pricing mechanisms (e.g., auctions) may be needed to enhance the role of low-carbon resources.

In the T&D sector, mobilizing non-state investment in distributed grids is essential. Challenges remain for local governments in promoting regulatory accountability and creating favorable conditions for private-sector engagement.[62]

On the demand side, great potential exists to advance decarbonization. Further price deregulation is needed to reflect real-time energy values, so as to improve load management and support climate-friendly energy usage.[63]

Last but not least, cutting-edge technologies, such as VPPs and energy storage, are critical enablers of decarbonization. While their integration into power markets is progressing through provincial and city-level programs, scaling these technologies will require strategic national policies to develop technical standardization, support commercial deployment, and unlock economies of scale. Moreover, new approaches are still being tested to leverage these technologies more effectively. Subnational governments will remain essential in piloting emerging technologies and exploring business models that attract investment for deployment at scale. Thus, ongoing subnational experimentation, along with supportive national policies, will be key to scaling innovation and driving China's power sector to meet its climate goals.

[62] Zihao et al., n.d.
[63] China Energy News, 2022.

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About the California-China Climate Institute

The California-China Climate Institute was launched in September 2019 and is a University of California-wide initiative, housed jointly at UC Berkeley's School of Law (through its Center for Law, Energy, and the Environment) and the Rausser College of Natural Resources. It is Chaired by Jerry Brown, former Governor of the State of California, and Vice-Chaired by the former Chair of the California Air Resources Board, Mary Nichols. The Institute also works closely with other University of California campuses, departments, and leaders. Through joint research, training, and dialogue in and between California and China, this Institute aims to inform policy makers, foster cooperation and partnership and drive climate solutions at all levels.